

CLAIMS

1. A method for performing an immunodiagnostic test for the presence of an infectious agent in an organism comprising:
 - a) immobilizing i) an antigen from said infectious agent or ii) an antibody specific for an antigen from said infectious agent on a piezoelectric (Pz) crystal;
 - b) measuring a resonant frequency of said crystal following step (a);
 - c) contacting said crystal with a biological specimen from said organism to be tested;
 - d) measuring a resonant frequency of said crystal following step (c);
 - e) comparing the resonant frequency measured in step (b) with the resonant frequency measured in step (d) wherein if the difference between the two frequencies is equal to or greater than a cut-off threshold value then said biological specimen is positive for the presence of said infectious agent.
2. The method of claim 1 wherein said antigen is a recombinant antigen.
3. The method of claim 1 wherein said infectious agent is a bacterium or a virus.
4. The method of claim 1 wherein following step (a) said crystal is contacted with a blocking reagent.
5. The method of claim 1 wherein said Pz crystal comprises a 0.1 to 1000 MHz AT-cut crystalline quartz crystal.
6. The method of claim 5 wherein said Pz crystal further comprises silver or gold electrodes.
7. The method of claim 5 wherein said Pz crystal further comprises an oscillator circuit capable of electrically stimulating said Pz crystal to oscillate at its inherent resonant frequency.
8. The method of claim 1 wherein said resonant frequencies are measured using a universal counter.

9. The method of claim 1 wherein said antigen is a transmembrane envelope protein.
10. The method of claim 9 wherein said transmembrane envelope protein is recombinantly produced as a fusion protein comprising glutathione S-transferase.
11. The method of claim 1 wherein said immobilizing is performed by a method selected from the group consisting of 1) physical adsorption onto a metal or polystyrene modified crystal and 2) covalent binding onto a polymer, silane or thiol compound treated crystal.
12. The method of claim 11 wherein said immobilizing is performed by dipping said Pz crystal into a solution of said antigen.
13. The method of claim 1 wherein said biological specimen is diluted prior to said contacting.
14. The method of claim 4 further comprising washing steps following step (a), the step of blocking, and step (c) wherein said washing is with a physiological buffer comprising a detergent.
15. The method of claim 14 wherein said physiological buffer is a phosphate buffered saline.
16. The method according to claim 4 wherein said blocking reagent is a non-active protein.
17. The method according to claim 16 wherein said blocking agent is bovine serum albumin or casein buffer.
18. The method according to claim 4 wherein said blocking reagent is applied by a dip technique or a drop technique.
19. The method of claim 1 wherein said contacting with a biological specimen is performed in a liquid phase or in a vapor phase.

20010925-52561001

20. The method according to claim 1 wherein said cut-off threshold is defined as the mean value of negative controls plus three times the standard deviation.
21. The method of claim 1 wherein said Pz crystal was previously used in a test which was negative for said infectious agent.
22. The method of claim 1 wherein said antigen comprises a peptide of SEQ ID NO:2.
23. The method of claim 1 wherein said antigen comprises ORF 5 of PRRSV.
24. A method of regenerating a used Pz crystal coated with i) a bound antigen or ii) a bound antibody by washing with a buffer containing boric acid/KCl-NaOH to remove any protein bound to said antigen or antibody while not removing said antigen or antibody thereby allowing said Pz crystal with bound antigen or antibody to be reused.
25. A method of regenerating a used Pz crystal by washing with dichromate acid thereby removing any bound protein and any bound antigen to produce a clean crystal to which new antigen can be bound.
26. A method of coating a Pz crystal with an antigen or antibody comprising dipping said crystal in a solution of said antigen or said antibody.
27. A diagnostic kit comprising a Pz crystal coated with a recombinant antigen or an antibody.
28. The diagnostic kit of claim 27 wherein said recombinant antigen comprises a protein of SEQ ID NO:2.
29. The diagnostic kit of claim 27 wherein said recombinant antigen comprises ORF 5 of PRRSV.

ALL